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Addendum StartPage: 0

PROJECT NO. 51840

RULEMAKING ESTABLISHING  
ELECTRIC WEATHERIZATION  
STANDARDS

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PUBLIC UTILITY COMMISSION

OF TEXAS

2021 JUN 23 PM 2:53

CLERK

**INITIAL COMMENTS OF NEXTERA ENERGY RESOURCES, LLC**

NextEra Energy Resources, LLC (“NextEra”) appreciates the opportunity to respond to the Request for Comments in Project 51840, *Rulemaking Establishing Electric Weatherization Standards*. NextEra and its affiliates have broad interests in the Texas electric market, including investments of approximately \$14 billion that provide wholesale generation service, transmission service, and retail electric products to consumers within the Electric Reliability Council of Texas (“ERCOT”) region of Texas. NextEra strongly supports the weather emergency preparedness objectives and the development of standards, as required under Senate Bill (“SB”) 3 and new Section 35.0021 of the Texas Utilities Code. NextEra respectfully submits the following comments and looks forward to serving as a resource to the Public Utility Commission of Texas (“Commission”) as it considers adopting reasonable standards and measures that will improve reliability in the ERCOT power region and weather emergency preparedness.

**I. INTRODUCTION**

NextEra and its affiliates comprise one of the largest electric power and energy infrastructure companies in North America and are leaders in the renewable energy industry. NextEra is the world’s largest generator of renewable energy from the wind and sun, as well as a world leader in battery storage. On a consolidated basis, NextEra and its affiliates operate a diverse generation fleet – wind, solar, natural gas, and nuclear – with approximately 58,000 MW of total generating capacity across 36 states and 4 Canadian provinces. Given NextEra’s diverse mix of fuel sources, multiple geographical locations, and significant experience in the renewable industry, NextEra believes it has a unique perspective that can assist the Commission as it develops

weatherization standards to satisfy the weather emergency preparedness requirements of Section 35.0021(b) of the Utilities Code.

NextEra respectfully submits that any weatherization standards adopted through this rulemaking should strike a careful balance of fulfilling the mandates required under SB 3 without discouraging future investment or financially burdening existing generation. NextEra has owned and operated generation facilities in Texas since 2001 and appreciates the importance of ensuring that the Texas electric market continues to attract sufficient investment in generation resources to meet Texas' ongoing growth in demand for electric power. It is therefore critical that weatherization standards are designed in such a way that existing generation is retained, while at the same time new investment is encouraged to grow rather than reduce Texas' reserve margins.

NextEra's comments focus on its existing generation fleet in Texas – wind, solar and storage. While wind turbine technologies vary by manufacturer, NextEra operates turbines in geographical locations that face extremely cold temperatures for long durations.

NextEra respectfully recommends that the Commission focus its efforts on developing a flexible framework of weatherization standards that: (1) recognizes that generation owners are required to operate their generation assets in accordance with Original Equipment Manufacturer ("OEM") design limits; (2) is based on proven, commercially viable technology for each type of fuel source and provides sufficient flexibility for generation owners to implement future advancements in technology as they become available; and (3) is non-discriminatory.

## **II. OVERVIEW OF NEXTERA'S GENERATION ASSETS**

NextEra's generation portfolio includes approximately 24,000 MW of wind and solar generation, of which 3,600 MW are in ERCOT. NextEra's experience operating generating facilities in a wide range of weather conditions, including extremely cold temperatures, provides

NextEra with the technical knowledge and experience to assist in developing well-designed weatherization standards.

In particular, NextEra owns and operates wind generation facilities that are located in geographic areas that routinely experience harsh winter conditions for extended periods of time. Despite the prevalence of extreme winter weather, NextEra's wind fleet has successfully performed in extreme conditions. Many of NextEra's wind generating assets in northern states are equipped with turbine cold weather packages. The portions of NextEra's wind generating portfolio located in cold weather states like Colorado, Iowa, and North Dakota, as well as in Canada reliably operate for extended periods of time at ambient temperatures between -15° Celsius and -30° Celsius, as cold weather packages from OEMS, when available, allow the turbines to operate in temperatures beyond the standard design.

Renewable generation assets fundamentally rely on exposure to the environment for their operations, and thus, they are engineered and constructed to reliably operate in an extremely wide range of weather conditions. While certain geographical locations face extreme heat (for example, southern California and New Mexico), several states – including Texas – experience both hot summers and cold winters. In considering how best to design their facilities, generation owners in these states have typically balanced the need for performance across a broad range of temperatures and weather conditions. Frequently, wind turbines in these areas do not include cold weather packages as this technology has historically been viewed as unnecessary given the wide operating range of standard turbine packages and their ability to perform reliably during the range of weather conditions Texas typically experiences. Accordingly, much of NextEra's Texas wind generation fleet is currently not equipped with cold weather packages.

### III. RESPONSE TO QUESTION 1

#### Question 1:

To fulfill the requirements of Texas Utilities Code § 35.0021(b), under what weather emergency conditions should the Commission require a provider of electric generation service in the Electric Reliability Council of Texas (ERCOT) power region to be able to operate its generation facilities? At a minimum, please address standards for temperature, icing, wind, flooding, and drought conditions. For each, please address whether the standard should vary by region or by type of generation facility. Please provide any relevant support for your recommendations, including existing or proposed standards in other jurisdictions, or related studies.

Texas Utilities Code § 35.0021(b) states in part “The commission by rule shall require each provider of electric generation service .... *to implement measures to prepare the provider’s generation assets to provide adequate electric generation service during a weather emergency according to reliability standards adopted by the commission ...*” NextEra interprets § 35.0021(b) to require the Commission to accomplish two things in this rulemaking: (1) adopt reliability standards related to weather emergencies; and (2) require Power Generation Companies (“PGCs”) to prepare their generation assets to provide adequate service during weather emergencies consistent with their OEM design limitations.

In adopting standards related to weather emergencies, several important factors should be considered. First, generation assets, like all industrial machines, are designed and built to standards that allow them to operate safely and reliably under a specific range of conditions. As a general principle, standards related to the provision of adequate electric service during weather emergencies must respect OEM design criteria, and prudent weatherization standards should not require PGCs to operate outside those OEM design limits. Operating power generation facilities outside design limits will void manufacturer warranties and increase the risk of equipment failure, which is counter to the reliability objectives of SB 3 and this rulemaking. Therefore, weatherization standards should allow for accommodation of OEM ratings for temperature, icing, wind speed, flooding, and drought. Where extreme weather exposures are more related to

generator siting decisions than OEM design limits, as in the case of flooding, NextEra believes a general framework of recommended standards based on prudent industry practices would be appropriate.

Second, it is important that the weatherization standards ultimately adopted are based on proven, commercially viable technology and that any standards provide sufficient flexibility for generation owners to implement future advancements in technology as they become available. In addition, because the design criteria for any facility depend heavily on the geographic location of that facility and the specific weather conditions at that location, standards adopted should also recognize the large variability in weather conditions across the many regions of Texas.

Third, weatherization standards ultimately adopted should be non-discriminatory and should not create generation “winners” and “losers,” either by mandating large costly changes to one type of generator or by adopting other requirements that favor one generation technology over another. The objective should be to identify performance standards that are appropriate for each generation technology and to implement proven, commercially viable technology that respects OEM design criteria and improves reliability across all generation types.

A basic summary of NextEra’s ERCOT generation asset OEM design ratings and development practices related to the weather criteria in Question 1 is provided in the table below:

			Low Temp (C/F)	High Temp <sup>1</sup> (C/F)	High Wind Speed at which turbines shutdown	Flood Mitigation for Generation Sites <sup>2</sup>
Wind	Manufacturer 1	Standard	-15/5	40/104	57 mph on average	Above 100-year flood elevation
		Cold Weather	-30/-22	40/104		
	Manufacturer 2	Standard	-10/14	35/95	40 mph on average	
		Cold Weather	-25/-13	35/95		
		Hot Weather	-10/14	40/104		
	Manufacturer 3	Standard	-20/-4	35/95	56 mph average	
Cold Weather		NA	NA			
Solar			-40/-40	50-60/ 122-140	Wind speeds at 45 mph start to impact generation	
Storage			-18/0	45/113	Designed to local building code standards	

#### A. Wind Turbine Winterization

NextEra has achieved reliable extreme cold weather performance in locations such as Colorado, Iowa, North Dakota, and Canada, where the majority of NextEra's wind turbines include cold weather packages. These cold weather packages allow wind turbines to operate at lower temperatures than the standard OEM design ratings, by relying on special low temperature lubricants and heating of specific mechanical components. For example, the addition of cold weather packages on NextEra's wind turbines in North Dakota and other cold winter locations has allowed some turbine models to continue operating at temperatures that are within 1° Fahrenheit of the coldest temperature on record in Texas. The Commission may wish to evaluate as a part of this rulemaking whether the use of cold weather packages may provide reliability benefits to the Texas electric market during emergency cold weather conditions.

#### B. Wind Turbine De-icing

NextEra embraces the development of new technologies, but it is our experience that effective de-icing and anti-icing technologies are not currently available for wind turbines in North America. NextEra has also confirmed in discussions with its OEMs that there is not a proven,

<sup>1</sup> Denotes the temperature at which output begins to derate.

<sup>2</sup> Infrastructure such as foundations that support generating facilities are typically designed to an elevation above or equivalent to water levels of a 100-year flood event.

commercially viable anti-icing product available for its existing wind fleet. While NextEra has begun working with various parties with the objective of developing a proven long-lasting de-icing or anti-icing solution, such an effort is in a research and development stage. Any standards that the Commission develops through this process should not mandate the use of unproven technologies.

### **C. Solar Generation**

Given solar generation is solid state and has limited moving parts, it is highly capable of withstanding extreme weather conditions, including those observed in Texas during Winter Storm Uri. Solar panels that use trackers to optimize energy production by changing the angle at which the panel is tilted towards the sun can also be angled to prevent snow from accumulating and to help any snow accumulation slide off the panel. This contrasts with fixed panels that may need to be cleared either by hand or machine to begin generating after a snowstorm. Solar hardware also operates to -40° Celsius, which is much lower than the lowest temperature ever seen in Texas, without any additional weatherization enhancement. Wind speeds can impact solar functionality, but the speed at which impacts begin is highly variable; depending on the angle of the solar panels and the speed and direction of the wind. NextEra's solar facilities are typically designed and constructed so the lowest point of the panels and all critical electrical connections are above the 100-year flood elevation. These facts suggest the capabilities of existing solar generation in Texas are more than adequate to support reliable grid operations, even well beyond the weather conditions seen in recent weather emergency conditions.

### **D. Storage**

Storage assets can be affected by high temperatures when temperatures exceed 45° Celsius as inverters or HVAC systems may no longer operate efficiently. At the low end of the temperature range, storage asset operations are limited to -18 °C primarily due to the ability of the HVAC systems to operate at low temperatures. NextEra designs its storage facilities to comply with local

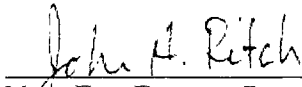
building code requirements, including wind speeds, and ensures all critical components are raised above the 100-year flood level.

#### **IV. CONCLUSION**

Weather in Texas is predictably subject to extended periods of extreme heat, and it is less predictably subject to short-lived periods of extreme cold. Because wind and solar generation assets are designed and built to operate in a range of weather conditions that are pre-determined by major equipment manufacturers, owners of these generation assets have limited ability to change their operating capabilities. Cold weather packages may provide a proven technology to modify the operating range of wind turbines across a broader range of weather conditions. In contrast, the absence of viable de-icing technologies should eliminate de-icing from the range of solutions wind turbines can adopt, and NextEra recommends against any attempt to include such a requirement in the weatherization standards development.

In summary, NextEra supports a weatherization framework that provides flexibility for generators to adopt new effective, proven technologies, but cautions against requiring generators to pursue unproven technologies. Generators should be required to maintain their generation equipment consistent with OEM instructions and engage in seasonally appropriate extreme weather planning and preparations so generators are available and can be utilized to the full range of operating capabilities during extreme weather emergencies. Requiring operations outside of the manufacturer's parameters or requiring the adoption of unproven technology would likely damage equipment or otherwise reduce the operating life and void warranties, thereby reducing overall reliability.

NextEra appreciates the Commission's deliberations on these matters and requests that the Commission consider these comments and adopt rules consistent with them.

  
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